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AN IMPROVED SPRING CAGE FASTENER

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With the advent of specialized entomological research, it has become necessary to cage insects on growing plants. In order to facilitate the study of the insects so caged, the plants are generally planted in flowerpots. Consequently it becomes necessary to attach the cage firmly to the flowerpot. Cages of various shapes and materials have been constructed. Each type has been designed to meet the special requirement of the insect studied. The characteristic that is common to them all is that they need to be fastened to the pot upon which they are used.

Several fastening devices have been developed for attaching cages of the open-bottom type. J. N. Tenhet (ET-14) described a flat band on the bottom of the cage that can be tightened by means of a stove bolt. T. E. Bronson (ET-22) described a way of drilling holes in the upper part of the pot and using nails to attach the cage. R. L. Wallis (ET-48) described a band on the bottom of the cage, using an overshoe buckle for the tightener. All these are successful for cages with open bottoms but cannot be used with cages that have closed bottoms.

During the progress of investigations of the sugar beet leafhopper (Eutettix tenellus (Baker)) it was found necessary to construct special cages to hold this small, elusive insect. It was found that many leafhoppers escaped or were lost if they had access to the soil of the pot. For this reason the beet leafhopper cages were constructed with a rigid solid bottom with provision for the insertion of the plant. This type of cage must rest on the soil within the pot or on the top of the pot. The disadvantage of this type of cage is that it is very susceptible to displacement by a light touch or wind.

After trying all fastening methods that have been published and a number of others, a simple fastening device has been designed that will attach closed-bottom cages to flowerpots of various sizes. This fastener can, with slight modifications, be used to hold cages of most any size, shape, or material.



### Construction

The materials needed for the construction of this device include some 12- and 25-gauge (American standard) wire and two No. 87 cadmium-plated springs (3/8 inch by 3 1/8 inches). A vise, a pair of large pliers, a hammer, and either a hacksaw or bolt cutters for cutting the large-gauge wire, are the tools required for making the assembly. The component parts as pictured in figure A, numbers 1 to 8, are cut for an 8-inch pot, such as is used at this laboratory. First cut two pieces of 12-gauge wire 18 1/2 inches long (fig. A-1). Make marks on each wire 2 1/2 inches from one end and 3 inches from the other end. Now set a 20-penny nail in the vise and bend an eye in each wire at the end marked at 2 1/2 inches, as in figure A-2. Then bend these wires at right angles at the 2 1/2-inch marks (fig. A-3) and also at the 3-inch marks, and shape them to the design of figure A-4 by bending them around a flowerpot with the hands.

To put these two pieces together, wrap the straight end of each wire around the opposite wire back of the eye bend, as shown in the completed circle of figure A-8. At this stage the eye loops will be projecting straight out. It is now necessary to bend them upward at right angles 1/2 inch distant from the circle in order to get around the shoulder of the pot, as can be seen in figure B. Cut two lengths of 25-gauge wire 7 inches long and make eyes in both ends of both pieces (fig. A-7), attaching one end of each piece to the eye of the circle. Fasten the springs in the other ends (fig. A-6). These springs are hooked to a wire bent over the top of the cage, as shown in figure A-5 for wooden cages, or to hooks soldered to a metal cage, as shown in figure B. Now you have the assembly as pictured in figure A, numbers 5 to 8.



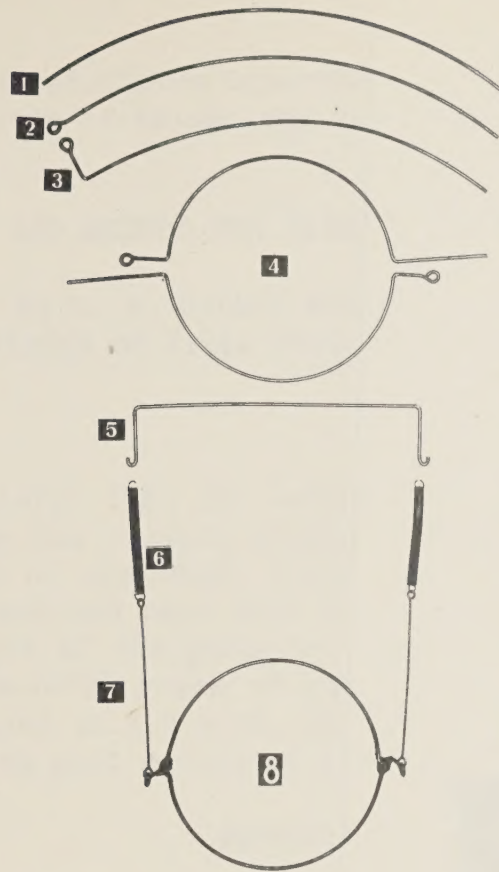


Figure A.--Details of the construction of the spring cage fastener.

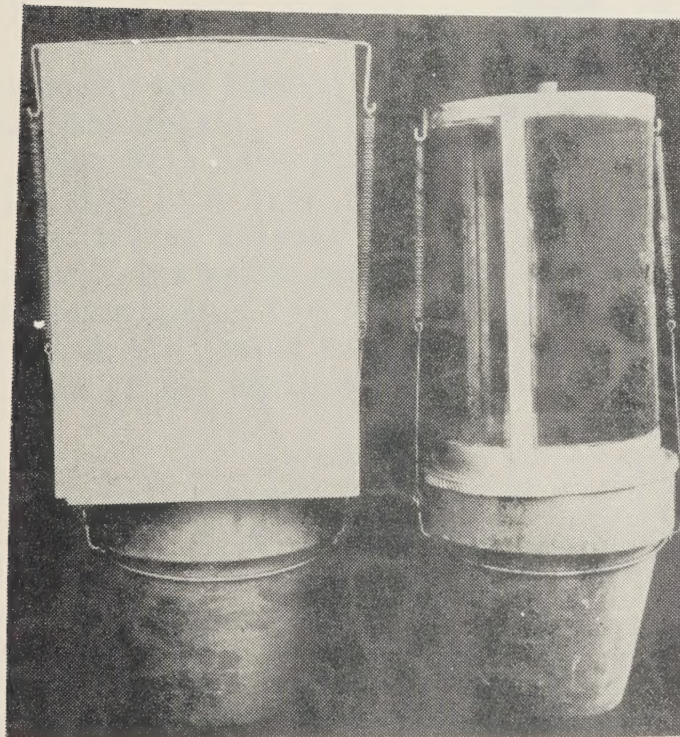


Figure B.--Spring cage fasteners in position for holding cages on flowerpots.

